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ABSTRACT

The assessment and placement system used in the Mathematics Learning Center of the New World Center campus of Miami-Dade Community College uses two test inventories: (1) a multiple choice mathematics test geared to the course which the student wants to pursue; and (2) the Canfield-Lafferty Learning Styles Inventory designed to determine an individual's preferred way of learning. The system tries to best fit the student's professed learning style and an available mode of instruction for the four courses: arithmetic, introductory algebra, intermediate algebra, and trigonometry. Four modes of instruction are available for each course, and a computer assigns students to one of these modes on the basis of the test results: audio-tutorial materials, programmed materials, tape/slide materials, and work-texts combined with video or audio tapes. Each course is divided into 12 units. The student is required to take a test after each unit and a comprehensive final examination. All exams are multiple choice so that they can be scored by computer. A student must meet criteria on each of the unit tests before going on to the next unit. If after taking the unit test twice, the student is still not successful, he/she is assigned to a tutor until mastery is demonstrated. Learning and evaluation are computer-managed using the college's Response System with Variable Prescription. The system is currently being evaluated. (AYC)

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ASSESSMENT AND PLACEMENT OF STUDENTS IN MATHEMATICS

A Presentation to
The 60th Conference
American Chemical Society
Two-Year College Section

by

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INTRODUCTION

This presentation will treat assessment and placement as an integral part of a comprehensive program of instruction in mathematics. The logic of this approach is easily seen when one realizes that any viable system of assessment and placement must match and funnel students into a compatible system of instruction.

Increased importance has to be placed on assessment and placement because of the type of student who is entering college today. Judging by the results of the nationwide Scholastic Aptitude Test scores for 1977, this last year saw the least academically prepared freshmen in the history of the examination. Perhaps more illuminating have been the results of the statewide minimum competency testing in Florida. Over one third of the 130,000 high school juniors who took the test failed because they could not score at the 70% level on eighth grade level mathematics.

These same students are applying and being admitted to our two and four year colleges. Their presence on our campuses has perpetuated a perplexing pedagogical crisis. How can the basic skills of these students be improved to a level where they may have a fair chance to earn a college degree? The remainder of this talk will be devoted to describing a system which has great promise of providing an answer to this problem.

A SYSTEM OF ASSESSMENT AND PLACEMENT

The assessment and placement system used in the Mathematics Learning Center of the New World Center (Downtown) Campus of Miami-Dade Community College is one which consists of combining the results of two paper and pencil inventories. The first inventory is a multiple choice mathematics test geared to the course which the student has indicated he wants to pursue. The second inventory is the Canfield-Lafferty Learning Styles Inventory designed to determine an individual's preferred way of learning. Through a set of decision rules programmed into a computer the student is assigned to one of four modes of individualized instruction.

A SYSTEM OF INSTRUCTION

The assessment and placement system tries for a best fit between the student's professed ideal learning style and an available mode of instruction for the four courses: arithmetic, introductory algebra, intermediate algebra, and trigonometry. The four modes of instruction for each course consist of one or more of the following: audio-tutorial materials (graded for reading level), programmed materials, tape/slide materials, and work-texts combined with video or audio tapes. The Auto-

tutor, a branched programmed teaching machine, and the SRA Skills Kit are used to give additional practice to needful students. A paraprofessional and/or student peer teacher is always available to answer questions concerning the content of instructional materials.

A COMPUTERIZED SYSTEM OF EVALUATION AND MANAGEMENT

Each course taught in this program is divided into twelve units or modules. The student is required to take a test after each unit. In addition, he/she is expected to take a comprehensive mid-term exam and a comprehensive final exam. All exams are multiple choice so that they may be scored by computer. A student must meet criterion on each of the unit tests before he/she is allowed to go on to the next unit. If criterion, eight out of ten, is not met on the first attempt to pass a unit test, the student must review the material missed and do extra problems before he/she is allowed to take a re-test which consists of a different version of the first test. The criterion for the re-test is raised to nine out of ten.

If a student is still not successful he/she is assigned to a tutor who takes over supervision of his/her learning program until mastery is demonstrated for the material of the particular unit. Upon certification of success by the tutor, the student re-enters the mainstream of the computer system.

Learning and evaluation are managed by a computer using the college's RSVP, Response System with Variable Prescription, computer program. RSVP begins by writing the student an introductory "letter" outlining the instructional system and detailing what is to be expected. It also delineates the individual's program of study by listing the appropriate educational objectives, by listing the materials to be studied, and by specifying how far to proceed in the designated material before a test is to be taken. The student works at his own pace with a gentle reminder that by specific dates a certain number of units should be completed. When he/she is ready a test is taken. The test is scored by computer and the student receives a printed analysis of his/her test including the score on the test, which problems were missed, what they covered, and where he/she may go in the materials to find the particular topic. Review of all missed items is recommended before the student proceeds. A record of each student's progress is kept by the computer.

RESEARCH AND EVALUATION

The system is currently being evaluated by a comprehensive program of research designed to answer the following questions:

Should a student be selected for the program on the basis of learning style or on the basis of mathematical deficiency?

Is a better result obtained by analysis of learning style for assignment to a mode of instruction or by random assignment to a mode of instruction?

How does participation in this program affect student attitude toward mathematics, if at all?

Can this individualized, computer-managed, multimedia, mathematics learning center do as good or better a job of preparing a student as the classroom?

And very importantly, is such a system of instruction cost effective?

CREDIT

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